Guidelines for the Development of an Integrated Aquatic Plant Management Plan

Preparation of a lakewide, long-term integrated aquatic plant management plan provides a valuable tool for lake protection. It also is a prerequisite to eligibility for Lake and River Enhancement program funding to control exotic or nuisance species. The following is a list of the minimum elements required in the development of an aquatic plant management plan in order to establish eligibility for LARE funding.

A. Problem Statement

Develop a realistic statement of the limitations imposed on important uses and/or ecological balance of the water body by the exotic species.

B. Management Goals

Provide specific management goals and related objectives that balance the desires of lake users with the natural limitations of the water body. Provide descriptions of each objective, which describes how they support the goal and which problems they address. Describe the management activities performed on the water body over the past ten years. Include any chemical, mechanical, or biological control, and lake level manipulations.

C. Watershed and Water Body Characteristics

Include descriptors of the watershed and water body. Watershed characteristics should include: location and size, land use activities, stream and wetland locations, and sources of nutrients that are degrading the water quality of the watershed. Water body characteristics should include: location; size; depth; shape; inflowing and outflowing water sources; water quality characteristics to include temperature, light penetration, dissolved oxygen and nutrients; shoreline land use; fisheries and wildlife characteristics; and information about wetland areas. In many cases these data are available from existing sources such as lake and watershed diagnostic studies, water quality monitoring studies, and lake or watershed management plans.

D. Present Water Body Uses

Describe present water body uses, which may include: boating and boat access areas; beaches and swimming areas; water skiing areas; and conservancy areas including important habitats for fish, wildlife, and rare plants. Include a map displaying priority areas for activities and important habitat areas for fish, waterfowl, and other wildlife.

E. Characterize Aquatic Plant Community

Tier I Survey

Perform an aquatic plant survey during the period from late July through late August using the techniques described in (IDNR 2004). This document can be downloaded

from the LARE Program Manual website at http://www.in.gov/dnr/soilcons/programs/lare/manual.html. A qualitative reconnaissance survey should be conducted using the Tier I procedure as described in IDNR (2004). The Tier I survey will be conducted to provide a distribution map of the aquatic plant species within a water body and to document gross changes in the extent of plant beds and relative abundance of species within a water body. The Tier I method also is used to identify areas for potential weed control efforts or areas with high quality habitats that should be protected. The Tier I methodology was modified from its original form (Shuler and Hoffman 2002) by requiring rake throws within plant beds to allow more accurate characterization of the occurrence of plant species within plant beds.

Tier II Survey

A quantitative survey should also be conducted using the Tier II Aquatic Vegetation Sampling Procedure. This survey will provide a quantitative description of the distribution and abundance of submersed aquatic vegetation within the water body and will allow comparison of the distribution and abundance of plant species over time. Tier II sampling should be conducted during the peak of plant growth and before and after plant control activities have occurred. The Tier II methodology was modified from its original form (Hoffman 2002) by replacing the original transect sampling method with a protocol in which sites are chosen randomly throughout the littoral zone of the water body.

Threatened and Endangered Species Surveys

Lakes will be screened by the Division of Soil Conservation prior to the initiation of aquatic plant sampling to determine whether threatened, endangered, or rare species are documented in the Indiana Natural Heritage database. If threatened, endangered, or rare plant species are documented to occur in a particular lake, additional detailed surveys to document their distribution will be conducted by a qualified aquatic botanist. When threatened, endangered, or rare species are encountered during sampling, the Division of Soil Conservation should be informed so that targeted surveys may be conducted to document the distribution of these species within the water body.

Aquatic Plant Survey Map

An aquatic plant survey map of the water body should be created from field notes and maps drawn during the aquatic plant survey, which should include the following:

- Approximate locations of emergent; free-floating; rooted, floating leaved; and submersed plant types.
- Locations of exotic, invasive plant species
- Locations of threatened, endangered, and rare species
- Locations of desirable native plants
- Sediment types
- Tributaries and outlet streams
- Locations of public and private access sites
- Locations of water level control structures

Description of Beneficial and Problem Plant Areas

General description –Provide a description of the main types of plants occurring in the water body with general locations of the plant beds and the maximum depth of growth. Estimate the total surface area occupied by plants.

Problem plant areas –Describe the areas of the water body that have problem plants. This may include areas with exotic, invasive species or excessive growths of native species that are perceived to be interfering with water body uses such as boating or swimming.

Beneficial plant areas –Identify areas of beneficial native plants that are important for conservation; protection of fish and wildlife habitats; threatened, endangered, and rare plant zones. The presence of these plants species may limit the use of plant control methods.

F. Aquatic Plant Management Alternatives

Control Options and Rationale

Identify the range of potential management options including aquatic plant control and beneficial plant bed protection and discuss their effectiveness, environmental impacts, costs, human health risks, and their applicability to the water body of interest in the plan. Potential alternatives include: no action; environmental manipulation; chemical, mechanical, or biological control methods; and any combination of these methods. A no action alternative should always be included to document the probable consequences of not taking action against problem aquatic plants. Coordination with IDNR Division of Fish and Wildlife biologists should occur early in the planning process to ensure that any proposed vegetation control actions will meet permitting requirements.

Identify specific locations and levels of control for each location

The level of plant control needed in different areas can be assessed by comparing the map of water body uses to the map of plant species distributions. Potential levels of plant control include: no control (e.g., conservation areas, important habitats), low level of control (e.g., protection of shoreline vegetation, fishing areas), and high level of control (e.g., boat ramps and docks, swimming areas).

Select the best options

Select the option or combination of options that is most appropriate for each location.

- Identify the proposed control option, the areas where it would be applied, and the level of control proposed.
- Assess the duration of control and its compatibility with the site.
- Determine operation and maintenance costs.
- Determine the degree of control to the site, including evaluating whether the control strategy is appropriate for the site.

- Evaluate the compatibility of the control strategy with fisheries, waterfowl, wildlife, and the ecology of the water body. This should include a consideration of risks such as over-eradication of aquatic plants and its affect on lake ecology, and the inadvertent spread of unwanted vegetation.
- Determine whether the strategy causes minimal human health risks.
- Make recommendations for best management practices for maintaining a healthy lake plant community that are tailored to the needs of the water body. Provide a strategy for maintaining desirable native aquatic plants.

G. Public Involvement

Lake residents, lake users and other stakeholders should be encouraged to participate in the development of the management plan and in the resolution of the problem to the maximum extent possible. This will provide lake residents and users the opportunity to understand the cause-effect relationships inherent to watershed land use, lakeside development, recreational lake use, and lake ecology. Interested parties should be identified, which may include lake residents, lake user groups, local government entities, and state and federal agencies. Two public meetings should be conducted: one early in the plan development process and another after management alternatives have been developed. Methods to inform the public of the results of the planning effort and the action strategy for implementing the aquatic plant management plan could include newsletters, brochures, media coverage, or signs posted around the lake. The Division of Fish and Wildlife should be consulted prior to posting signs at public access sites.

H. Implementation Strategy

Develop an implementation strategy describing the general approach that will be taken to attain each objective. This strategy should cover a period of not less than five years.

I. Action Plan

Develop an action plan to implement the integrated aquatic plant management plan. The action plan should cover a period not less than two years and include:

a) Develop a budget to implement the plan, including operation and maintenance costs, permit costs, monitoring and evaluation costs, and timeframes.
b) Review the costs, permitting requirements, environmental issues, and acceptability of the plan to lake residents and the general public.
c) Develop short-term management goals and action plans that are possible to accomplish given the costs, permits, degree of control, and public acceptance.
d) Develop long-term management goals and action plans that are feasible given the costs, permits, degree of control, and public acceptance.
e) Provide an assessment of future costs necessary to prevent recurrence of widespread exotic plant invasion, and determine the source(s) of the needed future funding.

J. Education

Make recommendations for a long-term education program regarding the value and management of aquatic plants. A program to periodically explain the management plan to the community of lake residents and lake users and to determine whether their needs and desires have changed will help to ensure that the public understands and agrees with the rationale for actions being taken.

K. Monitoring and Evaluation of Plan

Develop a program to monitor the degree of success of the management activities undertaken and an explanation of how the monitoring results will be used to determine the extent of management goal achievement. This should include quantitative descriptors of the plant community including those measures employed by Pearson (2004). The action plan should be flexible and capable of evolving as new information becomes available or monitoring results indicate a change in management direction is needed. A useful format for the written document is a three ring binder with tabbed sections for each of the major elements of the plan. As new information, monitoring results, and program changes become available the management plan can easily be updated.

References Cited

Hoffmann, J.E. 2002. Procedure manual for aquatic vegetation transect sampling. Indiana Department of Natural Resources, Division of Soil Conservation, Indianapolis, Indiana. 8pp. + Appendices.

IDNR 2004. Procedure manual for surveying aquatic vegetation: Tier I and Tier II, Indiana Department of Natural Resources, Indianapolis, Indiana.

Pearson, J. 2004. A sampling method to assess the occurrence, abundance, and distribution of submersed aquatic plants in Indiana lakes. Indiana Department of Natural Resources, Division of Fish and Wildlife, Indianapolis, Indiana. 37pp.

Shuler, S. and J.E. Hoffmann. 2002. Procedure manual for aquatic vegetation reconnaissance surveying. Indiana Department of Natural Resources, Division of Soil Conservation, Indianapolis, Indiana. 7p + Appendices.